CLAIMS

What we claim is:

1. A canola protein isolate consisting predominantly of 2S canola protein having a protein content of at least about 90 wt% of (N x 6.25) on a dry weight basis (d.b.) and having an increased proportion of 2S canola protein and a decreased proportion of 7S canola protein when compared to canola protein isolates consisting predominantly of 2S canola protein and derived from aqueous supernatant from canola protein micelle formation and precipitation.

2. The canola protein isolate of claim 1 which is derived by heat treatment of said aqueous supernatant.

3. The canola protein isolate of claim 1 which is derived from a selective membrane procedure in which an aqueous canola protein solution derived from canola oil seed meal and containing 12S, 7S and 2S canola proteins is subjected to a first selective membrane technique which selectively retains 12S and 7S canola proteins in a retentate and permits 2S protein to pass through the membrane as a permeate, the permeate is subjected to a second selective membrane technique which selectively retains 2S canola protein and permits low molecular weight contaminants to pass through the membrane as a permeate, and the retentate from the second selective membrane technique is dried.

4. The canola protein isolate of claim 1 having a protein content of at least about 100 wt% (N x 6.25) d.b.

5. A canola protein isolate having a protein content of at least about 90 wt% (N x 6.25) on a dry weight basis (d.b.) and containing at least about 85 wt% of 2S canola protein and less than about 15 wt% of 7S canola protein of the canola proteins present in the isolate.

6. The canola protein isolate of claim 5 wherein the isolate contains at least about 90 wt% of 2S canola protein and less than about 10 wt% of 7S canola protein of the canola proteins present in the isolate.

7. The canola protein isolate of claim 5 having a protein content of at least about 100 wt% (N x 6.25) d.b.

8. A process for the preparation of a canola protein isolate having an increased proportion of 2S canola protein, which comprises:

(a) providing an aqueous solution of 2S and 7S proteins consisting predominantly of 2S protein,

(b) heat treating the aqueous solution to cause precipitation of 7S canola protein,

(c) removing degraded 7S protein from the aqueous solution, and

(d) recovering a canola protein isolate having a protein content of at least about 90 wt% (N x 6.25) d.b. and having an increased proportion of 2S canola protein.

9. The process of claim 8 wherein said heat treatment step is effected under temperature and time conditions sufficient to degrade at least about 50 wt% of the 7S canola protein present in said aqueous solution.

10. The process of claim 9 wherein said heat treatment step degrades the 7S canola protein by at least 75% of 7S canola protein present in said aqueous solution.

11. The process of claim 8 wherein said heat treatment step is effected by heating the aqueous solution for about 5 to about 15 minutes at a temperature of about 75° to about 95°C.

12. The process of claim 8 wherein said aqueous solution of 2S and 7S canola proteins is concentrated supernatant from canola protein micelle formation and precipitation.

13. The process of claim 12 wherein said canola protein micelle formation is effected by:

(a) extracting canola oil seed meal at a temperature of at least about 5°C to cause solubilization of protein in said canola oil seed meal and to form an aqueous protein solution,

(b) separating said aqueous protein solution from residual oil seed meal,

(c) increasing the concentration of said aqueous protein solution to at least about 200 g/L while maintaining the ionic strength substantially constant by a selective membrane technique to provide a concentrated protein solution,

(d) diluting said concentrated protein solution into chilled water having a temperature of below about 15°C to cause the formation of the protein micelles, and

(e) separating supernatant from settled protein micellar mass.

14. The process of claim 13 wherein said supernatant is concentrated to a protein concentration of about 100 to about 400 g/L prior to said heat treatment.

15. The process of claim 14 wherein said supernatant is concentrated to a protein concentration of about 200 to about 300 g/L.

16. The process of claim 14 wherein said concentration step is effected by ultrafiltration using membrane having a molecular weight cut-off about 3,000 to about 100,000 daltons.

17. The process of claim 16 wherein the concentrated supernatant resulting from ultrafiltration is subjected to diafiltration prior to said heat treatment step.

18. The process of claim 17 wherein said diafiltration step is effected using from about 2 to about 20 volumes, preferably about 5 to about 10 volumes, of water using a membrane having a molecular weight cut-off of about 3,000 to about 100,000 daltons.

19. The process of claim 8 wherein said canola protein isolate has a protein content of at least about 100 wt% (N x 6.25) d.b.

20. A process for the preparation of canola protein isolate, which comprises:

(a) providing an aqueous canola protein solution derived from canola oil seed meal and containing 12S, 7S and 2S canola proteins,

(b) increasing the protein concentration of the aqueous solution using a selective membrane technique which is effective to retain 7S and 12S canola proteins in a retentate and to permit 2S protein to pass through the membrane as a permeate to provide a concentrated protein solution,

(c) drying the retentate from step (b) to provide a canola protein isolate consisting predominantly of 7S canola protein and having a protein content of at least about 90 wt% (N x 6.25) on a dry weight basis (d.b.),

(d) increasing the concentration of the permeate from step (a) using a selective membrane technique which is effective to retain 2S canola protein in a retentate and to permit low molecular weight contaminants to pass through the membrane in a permeate, and

(e) drying the retentate from step (d) to provide a canola protein isolate consisting predominantly of 2S protein and having a protein content of at least about 90 wt% (N x 6.25) d.b.

21. The process of claim 20 wherein said aqueous canola protein solution is provided by extracting canola oil seed meal at a temperature of at least about 5°C to cause solubilization of protein in said canola oil seed meal and to form an aqueous protein solution having a protein content of about 5 to about 40 g/L and a pH of about 5 to about 6.8 and separating the aqueous protein solution from the residual oil seed meal.

22. The process of claim 21 wherein step (b) is effected by concentrating the aqueous solution to a protein content of at least about 200 g/L while maintaining the ionic strength substantially constant having an ultrafiltration membrane having a molecular weight cut-off of about 30,000 to about 150,000 daltons, preferably about 50,000 to about 100,000 daltons, to provide the concentrated protein solution.

23. The process of claim 22 wherein the concentrated protein solution is subjected to a diafiltration step using about 2 to about 20, preferably about 5 to about 10, volumes of diafiltration solution.

24. The process of claim 23 wherein step (d) is effected by increasing the concentration of the permeate to a protein concentration of about 100 to about 400 g/L, preferably about 200 to about 300 g/L, using a membrane having a molecular weight cut-off of about 3,000 to about 30,000 daltons, preferably about 5,000 to about 10,000 daltons, to provide the retentate.

25. The process of claim 24 wherein the retentate is subjected to a diafiltration step using about 2 to about 20, preferably about 5 to about 10, volumes of diafiltration solution.

26. The process of claim 20 wherein at least one of the canola protein isolates produced in steps (c) and (e) has a protein content of at least about 100 wt%.

27. An aqueous solution of the canola protein isolate of claim 1.

28. The aqueous solution of claim 27 which is a canola protein isolate fortified soft-drink.

29. An aqueous solution of the canola protein isolate of claim 5.

30. The aqueous solution of claim 29 which is a canola protein isolate-fortified soft drink.